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ABSTRACT

This paper reports two studies which compared scores obtained on the Slosson Intelligence Test (SIT) and Peabody Picture Vocabulary Test (PPVT) and investigated the hypothesis that the representational level of the stimulus items in the PPVT is inappropriate for preschool children regardless of socioeconomic background. In the first study, the PPVT and SIT were administered individually to a total of 18 Head Start (HS) children of median age 5 years 2 months. In the second study 18 HS and 18 middle income (MI) 4- and 5-year-old children were asked to label stimuli shown in three representational forms: objects, colored pictures and black and white line drawings. Both MI and HS children labeled the objects more successfully than the pictures, but this discrepancy was greater for the HS children. It was confirmed that the HS children obtained lower scores on the PPVT than on the SIT, and it is suggested that this may be due to the highly representational stimuli of the PPVT. A training effect was found in both the HS and MI groups; performance was enhanced by the presentation of objects before pictures. The possibility of cultural bias in preschool screening tests is discussed and it is suggested that such bias may be reduced by: (1) using concrete objects in preschool stimulus labeling tasks, (2) ordering stimulus presentation from concrete to highly representational forms, and (3) considering the appropriateness of the SIT compared with the PPVT. (Author/GO)

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Test Stimuli: Representational Level with Middle Class and Head Start Children

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Abstract

Low Income and Middle Income 4 and 5 year old children were shown stimuli in three forms: objects, colored pictures, and black and white line drawings taken from commonly used assessment instruments, and were asked to label the stimuli. Results indicated that both groups of children labeled the objects more successfully than the pictures, although this discrepancy was greater for the low income children. In addition, order of presentation influenced labeling performance. These results suggest that attention be paid to the representational level of materials used with young children in testing and educational settings.

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TEST STIMULI: REPRESENTATIONAL LEVEL WITH MIDDLE CLASS AND HEAD START CHILDREN

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In a study comparing scores obtained on the Peabody Picture Vocabulary Test (PPVT) (Dunn, 1965) and the Slosson Intelligence Test (SIT) (Slosson, 1964) Raskin, Offenbach and Black (1974) found nursery school and third grade children obtained significantly higher scores on the SIT than on the PPVT. Although factors contributing to this difference were not discussed, the authors concluded that "care should be taken when the SIT is used for intellectual screening (p. 67)." Lamp and Traxler (1973) reported that the SIT had a high level of predictive validity for a Head Start population. Conclusions based on their study indicated, "that the SIT is a valid screening instrument for use in assessing intelligence and predicting reading ability of young disadvantaged children (p. 29)."

The present studies were carried out to determine whether differences in the composition of the SIT and PPVT might be responsible for the results reported by Raskin et al. (1974) and Lamp and Traxler (1973). Perusal of the two tests revealed that the PPVT is composed entirely of representational items (two-dimensional black and white line drawings) while the SIT has a minimum of representational items.

There is evidence to indicate Head Start children have difficulty classifying representational material, i.e. pictures, that is not experienced when objects, rather than their representations, are used as stimuli (Sigel & McBane, 1967, Sigel & Olmstead, 1968, Wei, Lavatelli & Jones, 1971). Sigel, Anderson and Shapiro (1966) concluded that the level of

representation of the stimuli affected the child's success on classification tasks.

In order to verify the replicability of Raskin et al.'s (1974) finding, the SIT and PPVT were administered to a group of Head Start children in the first study. The second study investigated the hypothesis that the representational level of the stimulus items in the PPVT is inappropriate for the cognitive level of preschool children regardless of their socioeconomic background. Thus, items from intelligence tests were presented to Head Start and "middle income" nursery school children for verbal identification as black and white and color representations and their referents.

METHOD

In the first study, the PPVT and the SIT were administered individually to 18 Head Start children (9 boys and 9 girls, median age = 5 years, 2 months) at the beginning of the school year.

In the second study, a specially designed test was administered to two groups of children. The Head Start group consisted of 18 children (9 boys and 9 girls with ages ranging from 4 years, 8 months to 6 years, 5 months and a median age of 5 years 8 months). The Private school group (middle income background) was composed of 11 boys and 7 girls ranging in age from 4 years, 8 months to 5 years, 6 months with a median age of 5 years, 3 months. The test was constructed using twenty age appropriate black and white line drawings that will be referred to as "black and white pictures" selected from the Stanford Binet (Form L-M), 2 items; the PPVT, 14 items; and the Denver Articulation Screening Test, 4 items. These pictures were colored appropriately for presentation as the "colored picture" level of stimuli. The objects were actual objects, not represen-

tational models, that the pictures represented and constituted the "object" level of stimuli. The children could touch the objects, if they wished, while they identified them. The items selected were primarily items found in homes or at school, or were words denoting action such as jumping, tying, or pouring.

The children were tested individually at their schools by the same white female examiner who was familiar to both groups of children. Each level of stimuli was presented on a different day with three day intervals between each presentation.

The dependent variable was verbal identification of the stimulus. The criteria for successful identification corresponded to the labels determined to be appropriate for items used in the tests from which the items were drawn. The children were asked to name the object, picture, or "tell what it is." In the case of the action words, the children were asked to tell what the experimenter was doing or what the person in the picture is doing.

The students in each school were randomly assigned to three groups to counterbalance for order of presentation of the levels of stimuli (representation) with the following orders of stimuli presentation: object, colored picture, picture: colored picture, picture, object; and picture, object, colored picture.

The children were examined at the end of the academic year.

RESULTS

Study 1

The scores for the SIT and PPVT were significantly different for the Head Start children tested ($t = 8.95$, $df = 34$, $p < .01$). The means and

standard deviations are presented in Table 1. These results are in agreement with those reported by Raskin, Offenbach and Black (1974).

Insert Table 1 about here

Study 2

In order to evaluate the effects of representational level of stimuli on verbal identification, the labeling scores were subjected to analysis of variance.

The 3(levels of representation) x 3(orders of presentation of the levels of representation) x 2(schools) latin squares analysis of variance showed significant main effects for schools (F 1,30 = 51.86, $p < .01$), representational levels (F 2,60 = 82.44, $p < .01$), and order of presentation (F 2,60 = 15.52, $p < .01$). The groups effect (between subjects interaction of level of representation x order) was significant (F 2,30 = 4.48, $p < .025$), as was the interaction of schools x levels of representation (F 2,60 = 12.60, $p < .01$). Schools did not interact significantly with order or within groups effect.

Post hoc analysis of the significant effect for levels of representation ($p < .05$) using the Newman Keuls test of treatment means (Winer, 1971), indicated that the mean for object identification (X = 12.694) was significantly greater than the means for colored pictures (X = 10.194) or black and white pictures (X = 10.166). There were no significant differences between the colored picture and black and white picture means.

The Newman Keuls test of the groups effect showed that subjects who received the stimuli in the order: object, colored picture, picture, had

significantly higher mean stimulus identification responses (X = 12.194) than subjects who received either of the other two orders. There were no significant differences between groups receiving the orders colored picture, black and white picture, and object (X = 10.444), or picture, object, colored picture (X = 10.416).

Orthogonal comparisons were made on the significant level of representation x school interaction. Means and standard deviations are presented in Table 2. The results of this analysis indicated significant

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Insert Table 2 about here

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inequalities at each level of representation between groups. Table 2 shows that the difference between groups becomes greater as the items to label become more abstract. The Newman Keuls test of treatment means indicated that in both schools object identification was significantly higher than either colored picture or black and white picture identification. There are no significant differences between colored pictures and black and white picture identification in either school.

DISCUSSION

The results of these analyses indicate that mean stimulus identification at all levels of representation differed between schools, with the private school children having higher means at each level of representation. Regardless of school, all children showed significantly higher mean stimulus identification of objects than either kind of pictures. The order of presentation: object, colored picture, picture; produced the highest mean scores in the groups that received it in both schools. The significant

level of representation x schools interaction indicates that while both groups of childrens' means declined in stimulus identification from objects to pictures, the decline was greater for the Head Start children than for the private school children. Similar response patterns for both schools were shown relative to the effects of the order of presentation of stimuli. The Head Start and private school children responded similarly to the orders presented. The presentation of concrete stimuli (objects) before the presentation of abstract stimuli (colored pictures and black and white pictures) served as a training device and seemed to enhance the performance of both groups of children.

Although Raskin, et al (1974) concluded that the SIT should be used with caution for intellectual screening, the results of the present study would indicate that the representational nature of the PPVT stimuli may account for the lower performance of children on this test as opposed to tests with minimal representational stimuli such as the SIT.

Both groups of children were significantly less successful identifying pictures of objects than the objects themselves. This might indicate that picture identification represents a higher order task than object identification and, therefore, is developmentally inappropriate for pre-school children. In addition, middle class children fared better than Head Start children thus increasing the possibility of culture bias when pictures are used as test stimuli with pre-school children. Therefore, tests constructed for screening pre-school children should be made developmentally more appropriate and less subject to culture bias by using concrete objects in stimulus labeling tasks.

A second possibility to alleviate developmental inappropriateness and culture bias would be the presentation of objects prior to the presentation

of pictures of the objects. The results of this study have demonstrated that sequencing of stimuli from concrete to abstract facilitated successful stimulus identification. A test constructed in this manner would become more an assessment of ability to learn rather than an assessment of possible prior experience with representational material.

The results of this study indicate that use of the PPVT as a screening device for pre-school children is open to question because of possible culture bias and developmentally inappropriate stimuli. The initial question of whether the SIT is an appropriate screening device remains to some extent unanswered: however, the differences in the performance of pre-school children on the PPVT and the SIT can be at least partially attributed to the representational nature of the PPVT test stimuli that is absent on the SIT.

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Table 1

	Mean	S.D.	(N=18)
SIT	103.06	11.17	
PPVT	91.78	15.83	

TABLE 2

Mean and Standard Deviation of Labeling Scores

for Each Level of Representation by Schools

	Objects		Colored Pictures		B/W Pictures	
School	$\bar{X}$	s.d.	$\bar{X}$	s.d.	$\bar{X}$	s.d.
Head Start	11.27	1.325	8.16	1.607	7.61	1.768
Private School	14.11	1.76	12.22	2.52	12.72	2.51